



Roy F. Weston, Inc.
Suite 5700
700 5th Avenue
Seattle, WA 98104-5057
206-521-7600 • Fax 206-521-7601
www.rfweston.com

MEMORANDUM

DATE: 22 December 1998

TO: David Bennett, WAM, U.S. EPA, Region X

FROM: Michelle Turner, Chemist, WESTON, Seattle
nm Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Chlorinated Pesticide Data
Laboratory Batch: K9806404
Site Duwamish River

WORK ASSIGNMENT NO: 46-23-0JZZ

WORK ORDER NO : 4000-019-038-5200-00

DOC. CONTROL NO.: 4000-019-038-AAAK

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Dena Hughes, Site Manager, WESTON, Seattle (memo only)
Kevin Mundell-Jackson, Database Management, WESTON, Seattle

The quality assurance review of six sediment samples, laboratory batch K9806404, collected from the Duwamish River has been completed. The samples were analyzed for chlorinated pesticides by Columbia Analytical Services of Kelso, Washington using EPA Method 8081. The samples were numbered

98384016	98384021	98384022	98384023	98384024
98384025				

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract. The review follows the format described in the *National Functional Guidelines for Organic Data Review* (EPA OSWER Directive 9240 1-05, February 1994).

This document was prepared by Roy F. Weston, Inc. expressly for the EPA. It shall not be disclosed in whole or in part without the express, written permission of the EPA.





QA Review Batch K9806404 (Chlorinated Pesticides)

Site: Duwamish River

Page 2

1. Timeliness

All samples were extracted 30 days after sample collection, exceeding the 14 day holding time criteria in the Sampling and Analysis Plan. However, prior to extraction, samples were stored frozen, thus extending the holding time. Samples were extracted within the 12 month holding time recommended by PSEP for frozen samples.

2. GC/ECD Instrument Performance

i) Retention Time Windows

Retention times of all pesticides were within windows calculated from the initial calibration

ii) DDT/Endrin Breakdown

The percent breakdown for 4,4'-DDT and Endrin was less than 20 percent for each compound and combined breakdown was less than 30 percent on both GC columns.

3 Initial Calibration

a) Individual Standard Mixtures

Retention time windows were calculated correctly.

Appropriate standards concentrations were used and peak heights of 50 to 100 percent of full scale were obtained.

Calibration factor percent relative standard deviation (%RSD) met QC criteria of 20 percent for pesticides and 30 percent for surrogates

4. Calibration Verification

Instrument blanks and PEM samples were analyzed at the proper frequency



QA Review Batch K9806404 (Chlorinated Pesticides)

Site. Duwamish River

Page 3

The difference between actual and calculated concentrations of individual pesticides was within QC criteria of ± 25 percent

5. Detection Limits

Instrument detection limits met project required quantitation limits with the following exceptions:

Sample	Compound	QL Gbal ($\mu\text{g/Kg}$)	Reported QL ($\mu\text{g/Kg}$)
98384016	gamma-Chlordane	1	2

Where quantitation limit goals were exceeded, undetected analytes were qualified (UI) to indicate matrix interference.

6. Blanks

a) Laboratory Method Blanks

Laboratory method blank frequency criteria were met.

No target analytes were reported in laboratory method blanks

b) Field Blanks

No field blanks were associated with this laboratory batch.

7 System Monitoring Compounds (Surrogates)

Surrogate compound percent recovery met quality control criteria (P-project, L-laboratory) for all samples except

Sample	Compound	Percent Recovery	QC Limits
98384021	Tetrachloro-m-xylene	29	30-150 (P) 20-107 (L)

This document was prepared by Roy F. Weston, Inc. expressly for the EPA. It shall not be disclosed in whole or in part without the express, written permission of the EPA.

QA Review Batch K9806404 (Chlorinated Pesticides)

Site: Duwamish River

Page 4

Sample	Compound	Percent Recovery	QC Limits
98384024	Tetrachloro-m-xylene	24	30-150 (P) 20-107 (L)
98384025	Tetrachloro-m-xylene	27	30-150 (P) 20-107 (L)
98384025MS	Tetrachloro-m-xylene	21	30-150 (P) 20-107 (L)
K981015-MB	Tetrachloro-m-xylene	29	30-150 (P) 20-107 (L)

The surrogate recoveries for Decachlorobiphenyl in these samples were met both project and laboratory QC limits. No qualifiers were assigned based on Tetrachloro-m-xylene recoveries.

8. Matrix Spike and Matrix Spike Duplicate

Matrix spike (MS) or matrix spike duplicate (MSD) percent recovery for the following compounds were outside QC guidelines (P-project, L-laboratory).

Sample	Compound	Percent Recovery	QC Limits
98384025MS	gamma-BHC (Lindane)	28	46-127 (P) 20-141 (L)
98384025MS	Heptachlor	29	35-130 (P) 20-108 (L)
98384025MS	Aldrin	29	34-134 (P) 20-181 (L)
98384025MS	Endrin	30	42-139 (P) 20-164 (L)
98384025DMS	gamma-BHC (Lindane)	40	46-127 (P) 20-141 (L)

Relative percent differences (RPD) between the MS and MSD percent recoveries were outside QC guidelines for the following compounds:

This document was prepared by Roy F. Weston, Inc. expressly for the EPA. It shall not be disclosed in whole or in part without the express, written permission of the EPA.

QA Review Batch K9806404 (Chlorinated Pesticides)

Site Duwamish River

Page 5

Sample	Compound	RPD	QC Limits
98384025	Endrin	55	45

No action was based solely on MS/MSD data

9. Laboratory Control Sample (LCS)

LCS percent recoveries were outside the QC limits (P-project, L-laboratory) for the following compounds:

Sample	Compound	Percent Recovery	QC Limits
K981015-LCS	gamma-BHC (Lindane)	29	70-130 (P) 21-123 (L)
K981015-LCS	Heptachlor	33	70-130 (P) 31-112 (L)
K981015-LCS	Aldrin	30	70-130 (P) 26-127 (L)
K981015-LCS	Dieldrin	34	70-130 (P) 18-161 (L)
K981015-LCS	Endrin	36	70-130 (P) 32-135 (L)
K981015-LCS	DDT	39	70-130 (P) 30-146 (L)

Results for compounds listed above were qualified as estimated (J) Undetected compounds were also qualified as estimated (UJ).

10. Field Duplicate Analysis

No field duplicate samples were associated with this sample delivery group

QA Review Batch K9806404 (Chlorinated Pesticides)

Site: Duwamish River

Page 6

11. Second Column Confirmation

The relative percent difference (RPD) in reported analyte concentration was greater than 35 percent for the primary and confirmation column for the following samples

Sample Number	Compound	DB-5 Conc (µg/Kg)	DB-1701 Conc (µg/Kg)	RPD
98384016	beta-BHC	0.23 (ND)	1.1	131
98384016	Heptachlor Epoxide	2.2	1.3	51
98384016	Methoxychlor	1.3	ND	NA
98384023	beta-BHC	ND	3.4	NA
98384024	Endosulfan I	1	ND	NA
98384025	Aldrin	1	ND	NA

Differences can arise from analytical interferences on one column. However, the relative percent differences are not deemed significant at the reported concentrations. The lower concentration was reported for each analyte.

12. Sample Analysis

A cursory review of raw data was performed. All laboratory deliverables were present and complete. A duplicate analysis of sample 98384023 was analyzed, no analytes were detected in the sample or duplicate. The case narrative noted that the MS/DMS recovery of Endrin for sample 98384025 was outside the laboratory QC limits because of suspected matrix interference. As the LCS recovery was within laboratory QC limits, no action was taken. No other problems were noted in the case narrative.

13. Laboratory Contact

No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

This document was prepared by Roy F. Weston, Inc. expressly for the EPA. It shall not be disclosed in whole or in part without the express, written permission of the EPA.



QA Review Batch K9806404 (Chlorinated Pesticides)

Site: Duwamish River

Page 7

Data Qualifiers

- U - The compound was analyzed for, but was not detected.
- UJ - The compound was analyzed for, but was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.
- J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not-met or because concentrations reported are less than CRDL or lowest calibration standard.
- R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.
- N - Presumptive evidence of presence of material (tentative identification).
- I - Elevated reporting limit due to matrix interference.

This document was prepared by Roy F. Weston, Inc. expressly for the EPA. It shall not be disclosed in whole or in part without the express, written permission of the EPA.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806404
Date Collected: 9/15/98
Date Received: 9/16/98

Organochlorine Pesticides

Sample Name 98384016 Units ug/Kg (ppb)
Lab Code K9806404-007 Basis Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
beta-BHC	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
gamma-BHC (Lindane)	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	UJ
Heptachlor	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	↓
Aldrin	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	↓
Heptachlor Epoxide	EPA 3540B	8081A	1	1	10/15/98	11/9/98	1	
gamma-Chlordane	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	UJ
Endosulfan I	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
alpha-Chlordane	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Dieldrin	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	UJ
4,4'-DDE	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Endrin	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	UJ
Endosulfan II	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
4,4'-DDD	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
Endrin Aldehyde	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
Endosulfan Sulfate	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
4,4'-DDT	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	UJ
Endrin Ketone	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
Methoxychlor	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Toxaphene	EPA 3540B	8081A	10	1	10/15/98	11/9/98	ND	

B The MRL is elevated because of matrix interferences

Approved By

S. Wiegand

Date 11/18/98

1522/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806404
Date Collected: 9/16/98
Date Received: 9/17/98

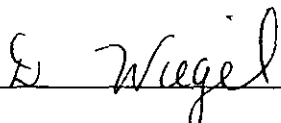
Organochlorine Pesticides

Sample Name 98384021
Lab Code K9806404-012
Test Notes

Units ug/Kg (ppb)
Basis Dry

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
beta-BHC	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
gamma-BHC (Lindane)	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	WJ
Heptachlor	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	↓
Aldrin	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Heptachlor Epoxide	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
gamma-Chlordane	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Endosulfan I	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
alpha-Chlordane	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Dieldrin	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	WJ
4,4'-DDE	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Endrin	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	WJ
Endosulfan II	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
4,4'-DDD	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
Endrin Aldehyde	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
Endosulfan Sulfate	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
4,4'-DDT	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	WJ
Endrin Ketone	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
Methoxychlor	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Toxaphene	EPA 3540B	8081A	10	1	10/15/98	11/9/98	ND	

Approved By



Date

11/18/98

1522/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
 Project: Duwamish River/4000-027-001-2019-38
 Sample Matrix: Sediment

Service Request: K9806404
 Date Collected: 9/16/98
 Date Received: 9/17/98

Organochlorine Pesticides

Sample Name 98384022
 Lab Code K9806404-013
 Test Notes

Units ug/Kg (ppb)
 Basis Dry

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
beta-BHC	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
gamma-BHC (Lindane)	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	WJ
Heptachlor	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	↓
Aldrin	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	↓
Heptachlor Epoxide	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
gamma-Chlordane	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Endosulfan I	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
alpha-Chlordane	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Dieldrin	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	WJ -
4,4'-DDE	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Endrin	EPA 3540B	8081A	-2-	1	10/15/98	11/9/98	ND	WJ
Endosulfan II	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
4,4'-DDD	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
Endrin Aldehyde	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
Endosulfan Sulfate	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
4,4'-DDT	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	WJ
Endrin Ketone	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
Methoxychlor	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Toxaphene	EPA 3540B	8081A	10	1	10/15/98	11/9/98	ND	

Approved By

E. Wiegand

Date

11/18/98

1522/020597p

WGT 11/16/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
 Project: Duwamish River/4000-027-001-2019-38
 Sample Matrix: Sediment

Service Request: K9806404
 Date Collected: 9/16/98
 Date Received: 9/17/98

Organochlorine Pesticides

Sample Name 98384023 Units ug/Kg (ppb)
 Lab Code K9806404-014 Basis Dry
 Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
beta-BHC	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
gamma-BHC (Lindane)	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	WJ
Heptachlor	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	↓
Aldrin	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	↓
Heptachlor Epoxide	EPA 3540B	8081A	1	1	10/15/98	11/9/98	2	
gamma-Chlordane	EPA 3540B	8081A	1	1	10/15/98	11/9/98	1	
Endosulfan I	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
alpha-Chlordane	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Dieldrin	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	WJ
4,4'-DDE	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Endrin	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	WJ
Endosulfan II	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
4,4'-DDD	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
Endrin Aldehyde	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
Endosulfan Sulfate	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
4,4'-DDT	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	WJ
Endrin Ketone	EPA 3540B	8081A	2	1	10/15/98	11/9/98	ND	
Methoxychlor	EPA 3540B	8081A	1	1	10/15/98	11/9/98	ND	
Toxaphene	EPA 3540B	8081A	10	1	10/15/98	11/9/98	ND	

Approved By

D. Wiegand

Date

11/18/98

1522/020597p

WJ 11/16/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
 Project: Duwamish River/4000-027-001-2019-38
 Sample Matrix: Sediment

Service Request: K9806404
 Date Collected: 9/16/98
 Date Received: 9/17/98

Organochlorine Pesticides

Sample Name 98384024
 Lab Code K9806404-015
 Test Notes

Units ug/Kg (ppb)
 Basis Dry

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
beta-BHC	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
gamma-BHC (Lindane)	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	us
Heptachlor	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	us
Aldrin	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	us
Heptachlor Epoxide	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
gamma-Chlordane	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
Endosulfan I	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
alpha-Chlordane	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
Dieldrin	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	us
4,4'-DDE	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
Endrin	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	us
Endosulfan II	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	
4,4'-DDD	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	
Endrin Aldehyde	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	
Endosulfan Sulfate	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	
4,4'-DDT	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	us
Endrin Ketone	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	
Methoxychlor	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
Toxaphene	EPA 3540B	8081A	10	1	10/15/98	11/13/98	ND	

Approved By

D. Wegel

Date

11/18/98

1522/020597p

06404SVG BJ3 - 15 11/18/98

00081

MET 12/16/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
 Project: Duwamish River/4000-027-001-2019-38
 Sample Matrix: Sediment

Service Request: K9806404
 Date Collected: 9/16/98
 Date Received: 9/17/98

Organochlorine Pesticides

Sample Name 98384025
 Lab Code K9806404-016
 Test Notes

Units ug/Kg (ppb)
 Basis Dry

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
alpha-BHC	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
beta-BHC	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
gamma-BHC (Lindane)	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	WJ
Heptachlor	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
Aldrin	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	↓
Heptachlor Epoxide	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
gamma-Chlordane	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
Endosulfan I	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
alpha-Chlordane	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
Dieldrin	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	WJ
4,4'-DDE	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
Endrin	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	WJ
Endosulfan II	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	
4,4'-DDD	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	
Endrin Aldehyde	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	
Endosulfan Sulfate	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	
4,4'-DDT	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	WJ
Endrin Ketone	EPA 3540B	8081A	2	1	10/15/98	11/13/98	ND	
Methoxychlor	EPA 3540B	8081A	1	1	10/15/98	11/13/98	ND	
Toxaphene	EPA 3540B	8081A	10	1	10/15/98	11/13/98	ND	

Approved By

D. Wiegand

Date

11/18/98

1522/020597p

WJ 12/16/98